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A History of Architecture

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A HISTORY OF
ARCHITECTURE

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PREHISTORIC TIMES

Of the beginnings of architecture we have, of course, no trace. Man's primitive ancestors had been shaping for themselves rude shelters against the fury of the elements, in caves or under cliffs, for countless ages, when finally that step was taken which constituted the first advance toward architectural feeling. This came only when they progressed beyond the dictates of the direst necessity and added some detail for the pleasure of the eye; that is to say, when to the naked behests of sheer practicality they added a touch of beauty. Like all the arts, architecture arose to satisfy the hunger of man for something beyond the mere appetites of his body. It was a luxury added to the daily grind for sustenance and reproduction and shelter, or, as some have expressed it, this was an outgrowth of the play-spirit which we see even in birds and animals.

Oddly enough, the earliest dates we can as-

sign for the European crude first reaching toward architecture are very nearly contemporaneous with those first monuments of Egypt and Babylonia from which we were actually to derive our later and more lasting type of civilization and architectural development. About 4000 B.C., that is, there was flourishing in various parts of what are now England, France, Ireland, etc., a prehistoric type of man who reared great monuments of crude stone which have survived to our day. Sometimes these consisted of unshaped plinths set upright in the ground, called *menhirs*, which we can only surmise to have served in some way for religious services. At Carnac, in Brittany, there are still long rows of these, thousands in number but they were also set up singly, at times crudely chiseled to represent a human form. Then there were rough structures where across the top of upright stones were laid huge slabs of rock, forming what are known as *dolmens*. In the case of the largest of these, as near Saumur in France, a room about thirty feet long was formed, approximately ten feet wide, with ceiling eight feet in height. What these were

ed for is also still unknown. *Cromlechs* were formed by erecting upright stones in a circle, such as we see at Stonehenge, on Salisbury Plain, in England, where the general arrangement and the alignment with the apparent motions of the sun have pretty well established for the fact that this was a religious structure, implying a considerable degree of civilization.

What devastation or invasion overthrew this culture we do not know, but certain it is that by the time of the coming of the Romans it had long since disappeared and the art of working in stone had been completely forgotten. Thus it is that these structures are still largely mysterious to us, problems for archeologists to ponder over. So far as we know, this civilization left no influence on later peoples, and thus the main current of our architectural development had its rise on the alien shores of the Nile and the Euphrates, to which we must turn for the beginnings of our cultural building.

I say nothing here of those marvelous structures which are now coming to light in our own hemisphere, the handiwork of Aztecs, Incas, &c.; for what we wish to trace in this booklet

is the rise of traditional architecture in Europe and America as it has shaped and influenced our civilization today. Thus also, those three great branches of Oriental architecture will not be treated, the Mohammedan, the Brahman and the Chinese and Japanese, which likewise lie outside our present province.

EGYPT

Thus one is safe in stating that as far as our civilization is concerned architecture originated in Egypt. The monuments still standing from 4000 B.C. must not be looked upon as the beginning, however, as by that date the Egyptians had already advanced far, and the structures they erected show a long background of historical development.

The oldest and greatest of Egyptian monuments still standing is that huge pile of stone which we know as the *Pyramid of Cheops* at Gizeh, and characteristically enough it is a tomb. For the Egyptians devoted more attention to the resting-places of their dead than they did to their own homes, to judge by the remains that have come down to us, and lavished their

hitectural powers on tombs and on temples
ne. The pyramids, of which we know more
n a hundred, most of which were built of
ne faced with marble, were most marvelously
lt, with long narrow passages leading to their
ters, where were buried the monarchs for
om they were erected. Of architecture proper
re is perhaps but little about these structures,
ich possess structurally only the most primi-
e suggestion of the arch to support the tre-
ndous weight bearing down on the open cen-
l chambers.

More noteworthy from an architectural point
view were the temples of the Egyptians, the
est of which date from about 1700 B.C and
er. These were built in a heavy style, more
ble than elegant, with great open courts lead-
r to immense halls filled with giant columns.
e outward aspect of these structures was
her blank, owing to there being no visible
ndows, and the entrance was generally
ough a huge gateway called a *pylon*. The
umns employed by the Egyptians were topped
ornaments derived from the lotus and the
m or with carved effigies of the goddess

Hathor. Some of these were seventy feet height and nearly twelve feet in diameter, richly carved and bright with color from top to bottom, so that an Egyptian temple must have been a brilliant spectacle with the glare of the tropical sun beating down on its painted walls and reflected into its halls from the open court. Later, under the Ptolemies, who were of Hellenic origin, some more delicate temples were erected, of which we have in recent years seen some of the most lovely, at Philae, through the erection of the great irrigation dams in the Nile.

CHALDEAN ARCHITECTURE

Over in that other great fertile river-basin of ancient times, drained by the Tigris and Euphrates, there was another civilization dating back to 4000 B.C., and furnishing us with extremely early architectural remains. But whereas the Egyptians had exhaustless quarries of stone upon which to draw, these people were forced to construct with baked clay, which they formed into bricks, frequently glazed with brilliant colors, many of which have even today not lost their brilliancy. In one important respect the

ples surpassed the Egyptians architecturally, though in general they were less skilled: they knew how to construct the arch, and used extensively in their buildings, even vaulting corridors in their palaces and temples.

The Biblical Ur of the Chaldees has recently been yielding some interesting discoveries to theological investigators, dating perhaps from about 2200 B.C. These would seem to indicate that whereas the Egyptians had devoted most attention to tombs and temples, the Chaldeans were more concerned with the erection of vast palaces for their rulers. Later, when the Assyrians had conquered the land, in about 1250 B.C., they adopted the general characteristics of the older style of building, erecting at Nineveh great structures on raised platforms, almost without windows, with great doorways flanked by enormous carved figures of winged lions bearing human heads. The brick walls were covered with slabs of alabaster, and with those carvings depicting scenes of hunting or of battle which are now preserved in our museums. Still later came the period of Babylon, when arose that type of temple, pyramidal in shape,

rising by huge steps to the sanctuary of the Bel on top, which was the prototype of the famous Tower of Babel said to be the origin of our troublesome perplexity of tongues.

Of these two great original types of building the Greeks adopted the columns and lintels from the Egyptians while passing by the arch and the vault of the Assyrians. But from these latter people they probably adopted certain forms of ornament, such as the rosette and the spreading palm. The Romans very likely derived their use of the arch and even of the dome from Assyrian usage, as handed down to them through the Lydians and the Etruscans. Thus we owe more to these two very early cultures architecturally than we ordinarily realize, and if we had not derived from them, we should to-day be living and working in structures perhaps far different from what we have.

PERSIAN AND HEBREW ARCHITECTURE

When Cyrus the Great and Cambyses conquered the Orient in the sixth century, a new development in architecture was opened, which we call the Persian, lasting about two centuries.

Such luxury was now unfolded as had never been seen, embodying elements from the Egyptians and the Assyrians, in the great palaces of Persepolis and Susa. They employed baked bricks, frequently highly glazed in bright colors, as the Assyrians had done, but also they employed columns, after the Egyptian manner, except that they now used wooden beams between these supports, where the Egyptians used slabs of stone, and thus the later work was more open and wide-spaced. In the Louvre Museum at Paris is preserved one of the huge capitals from one of the Susa columns. It is an enormous affair, twenty feet in height, worthy to crown a shaft nearly seventy feet in height, such as was employed. It consists of a two-headed bull, between whose shoulders rested a wooden beam, while a transverse beam rested on the two heads.

The Hebrews have ever been an adaptive people, taking from the peoples with whom they came into contact anything which suited them, and so we are not surprised to find that their architectural style was based on elements derived from Egyptians, Assyrians, Phoenicians,

Greeks, Romans, etc. Even that ancient temple erected by Solomon about 1012 B.C., with its sanctuary preceded by courts and porticoes of columns after the manner of Egyptian temples, was also blended with Phoenician and Assyrian details, as described so minutely in I Kings, 6-7, and less compendiously in II Chronicles, 3-4. For King Solomon employed beams and boards of cedar and fir, you will remember, and lined the whole sanctuary with gold beaten into raised designs, and had two great columns of brass, and a huge basin or fountain of the same material, cast all in one piece with its base. These latter details were all borrowed from other sources than Egypt. The way in which he built it on an immense raised platform also points to Assyrian influence. Later, of course, when the temple was enlarged by Herod to twice its former size, in about 18 B.C., Greek and Roman elements entered in, although still the ancient Egyptian and Assyrian details persisted. Here again we can realize our close relationship to those old peoples of the Nile and the Euphrates.

PREHISTORIC GREECE

For the beginnings of European architecture proper, we must go to the islands of the western Mediterranean, to Crete and Cyprus, to the islands of the Aegean Sea, to the mainland of Greece and its cultural dependencies in Asia Minor, back about 3,000 years before Christ, 1800 years before the Trojan period, and more than 2100 years before the time of Homer. Here flourished a race of men who built great palaces with painted walls, and who at least 2000 years before the Christian era carried on an active trade with Egypt. Their very existence was hardly more than guessed at until the end of the nineteenth century, when Schliemann, an amateur German archaeologist, startled the world with his excavations on the site of Troy and elsewhere. Since then we have been able to build up a considerable knowledge of these early peoples, the forerunners of the Greeks whose architectural genius has dominated western building for twenty-five centuries.

At Troy, Mycenae, Tiryns, Cnossus, etc., were found architectural vestiges of these civiliza-

tions, beginning with rough walls of huge unshaped stones, at times twenty feet in length so colossal that the later Greeks attributed them to the Cyclops, a race of giants whence our name for this type of work, cyclopean. At Mycenæ was found the Lion-Gate with its two sculptured lions above the crude stone gate-way. Between them was carved a column, tapering toward the bottom, as we today taper our table-legs, and from this we may judge that these early progenitors of the Greeks employed such columns in their buildings. But they also used wood, a fact which left vestiges on even the stone carvings of the later classic times, as we shall see. They seem not to have built temples, but the arrangement of their dwelling-places foreshadowed the later arrangement of the stone temples of the Greeks, with a columned portico leading into the hall, where columns supported the roof about the main central hearth. Domed tombs were erected, a practice not followed by the Greeks, which seems to point to acquaintance with the work of the Assyrians, since the Egyptians did not employ any form of the arch.

It is still a moot question, to what extent we

owe to these primitive peoples those classic types of columns, the *three orders*, with which we shall deal later. Certain it is, that about 1100 B.C. there swept down from the north a horde of half-wild peoples, who destroyed the old Mycenaen civilization, so thoroughly that even in Homeric times, about 800 B.C. the older civilization had become mythical. Among these invaders were the Dorians, who later symbolized to the Greeks the times of primitive simplicity and after whom the simplest form of Greek column was called. Little did they realize the part these barbarians had played in wrecking that earlier "glory that was Greece!"

EARLY GREECE

The earliest monuments we have of historic Greece date from about 650 B. C., although historic records go back to the first Olympiad about one hundred years earlier. The structures we have are already of a highly developed style, and seem to point in their structure to earlier construction in wood. Even the classic stone columns of the Greeks are said by scholars to derive from earlier times when

these were merely the shaped trunks of trees set on end. But of these more primitive structures we have found no remaining ruins.

Temples were the chief concern of the Greeks in architecture, and in this field they developed a type radically different from anything that had gone before. For whereas the Egyptians had created temples presenting a heavy and almost unbroken outward aspect, using heavy columns only for the inner support of their roofs, and the Assyrians and Persians also had given to their structures a closed appearance, the Greeks boldly brought their columns out into the open, and used them as a decoration for the exterior of their structures, an idea which we have used ever since, and which seems so natural that it is hard to realize how great was the inventive genius of the Greeks to achieve such a result. The temples were always rectangular, with an inner hall wherein was placed the image of the god. The Egyptians and the Hebrews had constructed a mysterious sanctuary within court after court, not to be seen of any except the chosen priests, hidden from the common people. Later Christian churches were built for the gathering of large

congregations. But neither of these features was necessary to the Greeks, and in comparison with the Egyptian temple at Karnak, or with St. Peter's at Rome, for instance, the Greek temples were small. At each end of the building, above the columns and the *entablature* they bore, a low triangular wall was built and this established the slope of the roof. This triangular space of the gable, called the *pediment*, was generally filled with sculptured figures, and low reliefs were also generally used to decorate the upper sections of the *entablature*.

The earliest monuments we have, before 450 B. C., including the great *Temple of Zeus at Agrigentum*, the *Athena Temple* on the island of Aegina, the *Temple of Zeus at Olympia*, and the so-called *Theseum* at Athens, all employed the *Doric Order* of architecture, the simplest of the classic styles used by the Greeks, as will be made clear in a following section. At first the columns were short and squat, in height hardly more than four times their width, and the entablature above them was unduly wide. But by the end of this early period, as we can

see in the wonderfully preserved *Theseum*, the proportions had become refined almost to the perfection of later times, and Greek architecture was on the threshold of its highest manifestation, in the sublime fifth century B. C., an epoch-making era in architecture as it was also in drama, in sculpture, and, if we can credit the writing of contemporary Greeks, in painting.

GREEK PERFECTION

The Persian War in the middle of the fifth century, B. C. left Attica triumphant although its capital city, Athens, was in ruins. Pericles, lover of the arts and wise dictator that he was, set about the task of making Athens beautiful, which with his chief councilor, Phidias, who is known to us also as a sublime sculptor, he succeeded in doing. We still make pilgrimages to Athens, to look upon what is perhaps the most beautiful building ever erected, the *Parthenon*. This temple was erected on a hill in the city, called the Acropolis, where were gathered several others of the finest structures of classical Greece, masterpieces all of them. The

Parthenon also was built in the Doric style, but it had now reached such subtle refinements of beauty that one never tires of looking at it. Solidly built and yet not too heavy, delicate without weakness or triviality, open to the light and air and yet firmly rooted to the earth, this building was most harmonious in its proportions, a perfect blending of all the characteristics a building should have. Moreover, it was constructed of the finest marble throughout, without cement and yet so finely shaped were the stones that we can still marvel at the skill of the builders. Here was housed that great statue of Athene, fashioned of ivory and gold, by Phidias, of which I have spoken in the booklet on Sculpture.

In several of the other buildings on the Acropolis, there was a blending of the Doric order with the *Ionic order* of architecture, which had been developed in the Greek dependencies of Asia Minor. Such was the great entrance portico to the Acropolis, called the *Propylea*. The delicate little *Temple to Nike Apteros* (or the Wingless Victory) employed only the more slender Ionic order, to be de-

scribed later, while the *Erechtheum* employed not only two different sizes of this type of column but also had a porch in which carved figures of maidens, known as *Caryatides*, supported the entablature, one of the loveliest creations of all architecture. Another feature of all this work which has ever since caught the hearts of the lovers of architecture is the beauty of the different mouldings employed. These are in every case so nicely adapted to the function they must serve that they alone would stamp the Greeks as masters of their art.

The Parthenon today is only a ruin, but we are still able to trace out some of the delicately subtle refinements employed by the Greeks. Thus certain straight lines have been found to be gently curved, in order to make them *seem* straight. The columns at the corners are slightly less widely spaced than the others, again to make them seem the same distance apart. Thus the Greeks employed optical illusion in the service of their divine architecture, a fact which has only become known to us within comparatively recent times.

Besides temples, the Greeks built open-air

theatres, consisting of rows of seats slightly more than semi-circular in arrangement, with a raised platform of stone for the stage, backed by a permanent structure decorated with doors, columns, etc. Tombs are less frequent, although later there was one superb example, the Mausoleum in Halicarnassus, one of the seven wonders of the ancient world, consisting of a square hall surrounded like a temple with columns and supporting a high pyramid of stone on top of which rose carved portrait statues of Mausoleus and his wife, standing in a chariot. This dates from about 354 B. C. Then there were open structures for athletic contests and games, of which the Greeks were so fond.

After the sublime fifth century there was a falling away from the chaste and perfect architecture of Periclean times. The influence of Alexander the Great was toward greater ostentation. The huge *Temple of Diana at Ephesus* had columns of which the base was richly carved, as we can see in the British Museum today. A third type of column, the *Corinthian order* was now much employed, as in the lovely little *Choragic Monument of*

Lysicrates, erected to bear the tripod won at a choral contest. It remained for the Romans to develop fully this rich form of ornament, as they did in the enormous *Temple of Olympian Zeus* at Athens, whose soaring Corinthian columns we can still see today, fifty-seven feet high. This was in the second century B. C.

THE ORDERS OF ARCHITECTURE

Mention has already been made of the three classic orders of Greek architecture, the *Doric*, the *Ionic*, and the *Corinthian*. To these in Roman times was added another, the *Composite*. Ingenious as we moderns think ourselves to be, we have not to this day been able to devise a type of column which can compete in harmonious treatment with these inventions of the old Greeks and Romans. Thus we are still in debt to the ingenuity of those ancient builders, and if you will but look at our banks, post offices, colleges, schools, etc., you will realize how true this is.

In any illustrated dictionary or encyclopaedia, under the heading *Orders* you will very likely find illustrations that will make clear to you

the distinguishing features of these four styles. The Greeks began, as we have seen, with the Doric, so-called because they thought it had come down to them from the Dorians. It was the simplest of the orders, having no base, and only a plain square capital above the slightly spreading top of the column. In the Ionic order, the capital of the column was characterized by a scroll or volute, which hangs in a curl at either side of the capital and seems to soften the impact of the entablature above. The Corinthian capital was still more ornate, and seems to stand upright, whereas both the others had lain flat. It was decorated with two rows of curling acanthus leaves, which rise to mask the supporting core in the center. These columns had tended to grow more slender in the successive orders. The entablatures above had also undergone certain changes, but if you will fix these three types of capital in your memories, you will be able readily to recognize the orders. The Composite order was simply a blending of the Ionic and the Corinthian orders, with a capital employing both the acanthus leaves and the curled scroll. The orders underwent but slight change at the hands of the Ro-

mans, although their columns were frequently left plain, whereas with the Greeks the columns were always channeled or grooved, or *fluted*, as is the architectural term.

ROMAN ARCHITECTURE

Although the Romans were largely inspired by the Greeks in many of their decorative details, as for instance, the classic orders, it was from the Etruscans that they derived another element which played a prime part in the development of their architecture, the arch. The Etruscans were of Asiatic origin, coming from Asia Minor about 1000 B. C., and they had brought with them from Assyrian models the principle of the vault, which later enabled the Romans to build arches, vaulted ceilings, and domes, such as the Greeks had never employed. Thus was laid the foundation for almost all later types of architecture, Byzantine, Romanesque, Gothic and Renaissance. The use of the vault enabled the Romans to give to their structures an open span over great spaces, which the Greeks could never have compassed with their stone and wooden ceilings, and brought

about that sense of grandeur and imposing size which are so characteristic of Roman architecture.

Temples were still built largely on the Greek model, and their theaters were not much different, but to these were added huge baths, amphitheaters, forums, great meeting places called basilicas, triumphal arches, commemorative columns, aqueducts, bridges, etc., such as the older peoples had never dreamed of. The *Pantheon* at Rome, built in the reign of Hadrian, (117-138 A. D.) was a circular temple with walls twenty feet thick and bearing a hemispherical dome 140 feet high and 142 feet across. It is still one of the most inspiring structures on earth. The *Basilica of Constantine* had a main hall 325 by 85 feet, rising to a vault 117 feet in height, built of concrete. The *Baths of Caracalla* and of *Diocletian*, built in 211 A. D. and 302 A. D., respectively, were incredible in size, the latter capable of accommodating 3,500 bathers at one time. The *Colosseum* at Rome, completed in 82 A. D., was 607 feet in length and 506 feet across, with outer walls 180 feet high, capable of seating no less than 87,000 spectators. The huge *Circus of Caligula* and

Nero at Rome, also built for athletic spectacles, could hold more than 300,000 people. These will give some idea of the scale on which Rome built her structures. And it was not in Rome alone that these gigantic creations were erected. Wherever her empire was extended, there you will today find traces of like buildings, in Asia, Africa and all over western Europe. From the first to the fourth centuries, A. D., Rome was dominant in architecture as she was in government.

Roman décoration, called upon to cover so much vaster spaces than had been the case in Greece, developed certain new methods. For instance, in the case of the overwhelming outer wall of the Colosseum, there were piled arcades of arches and columns one on top of another, four stories in height. The lowest employed Doric columns, the next Ionic, and the last two, Corinthian. The columns did not stand free from the wall, but partially built into it, in a manner called *engaged*, a method we have continued to employ to this day, as also is the case with the superimposed orders of columns. Moreover, whereas the Greeks had built of solid marble, the Romans fell into the practice of

building in concrete, or even in rubble, and then coating the vast expanses of their walls with thin veneers of marble or other fine stones. Their Arches, of which we still have three fine examples at Rome, the *Arch of Titus* (71-82 A. D.), the *Arch of Septimus Severus* (203 A. D.), and the *Arch of Constantine* (330 A. D.), were covered with a wealth of ornament such as the Greeks of the fifth century B. C. would never have employed, so opulent and overpowering it is. The great *Column of Trajan* at Rome, 140 feet in height, still standing, bears a spiral band of ornament in high relief, a novel and effective decoration which Napoleon copied in his *Colonne Vendôme* at Paris.

EARLY CHRISTIAN ARCHITECTURE

When Christianity was first officially recognized by the Emperor Constantine in 328, the persecuted followers of the faith were at last free to come out of the catacombs where they had been carrying on their devotions, and to erect for themselves places of worship above ground. They adopted two forms of church, both from existing models of pagan buildings.

The first of these, the *basilica*, we have already seen, was a meeting-place for the Romans in their secular and judicial dealings, and this form the early Christians took for some of their most typical structures. The Christian basilica consisted of a single long nave, broad and high, with aisles on either side, from which it was separated by an arcade supported on arches. The aisles had lower ceilings than the nave, which rose to a clerestory pierced with windows. At the end of the nave stood the *triumphal arch*, richly decorated with paintings and mosaics, and behind this stood the altar, in a semi-circular domed apse. The whole was ceiled with wood, which was frequently brightly gilded and decorated, as were also the side-walls. The columns were of fine marble, and the floor was of mosaics or patterned marbles. On the whole, these structures were most impressive, as we can still see at Rome, in the churches of *St. Paul Beyond the Walls* (386 A. D.) and *Santa Maria Maggiore*, and at Ravenna, in *St. Apollinare Nuovo* (520 A. D.) and *St. Apollinare in Classe*.

In all these structures there is evident an Oriental delight in color and decoration, and

it is well to remember the close connections at this time existing between Rome and Byzantium, today known as Constantinople. Constantine, after whom the city was re-named, was responsible for buildings not only in Rome, but also in Bethlehem and Jerusalem, and in the city on the Bosphorus, where he built that great church which we shall consider in the next section, called *Hagia Sophia*. With the decay of Rome, Ravenna became the seat of the Court in 404. In 534 it fell into the hands of the Byzantines, which meant an influx of Oriental taste, which we still see reflected in its brilliant colors.

But the exterior of these early churches was almost always somber and plain. A bell-tower was sometimes added, standing apart, as it still does in many Italian churches, and arcades were sometimes set up, but generally we may say that this architecture was essentially an interior art, almost negligent of outward appearances.

The other form adopted by the early Christians was the circular church, which was a favorite form with Constantine, copied, perhaps, from the Pantheon. At Rome we can still see

the early church of *St. Costanza*, erected by the Emperor for his sister of that name. It became the prototype of many of the churches and baptisteries of later Italy, as witness Pisa and Florence.

BYZANTINE ARCHITECTURE

Meanwhile the eastern branch of the Christian church had been creating a religious architecture of its own along different lines of development. Influenced by its greater proximity to the Orient, it made greater use of color and of the dome than did the early Christian church in the West, and especially in the wonderful manipulation of the latter element do we find the characteristic feature of Byzantine architecture. For not only did these people raise huge domed structures, as the Romans also had done, but they devised a method of erecting their domes on buildings of square ground-plan, filling in the corners with ingenious curved triangular sections of wall called *pendentives*, one of the most beautiful of architectural achievements.

The largest Byzantine church, *Hagia Sophia*,

or the Church of Divine Wisdom at Constantinople, frequently mis-called St. Sophia, shows us today in its full glory this wonderful method of building. The great central open space is no less than 200 by 100 feet in size, above which rise a series of half-domes, culminating in the huge central dome 180 feet above the ground. The two side walls consist of two superimposed arcades of rich marble columns, with windows pierced above, and circling the dome there is another row of windows, forming a sort of crown of light, another tremendously effective arrangement. The lower walls are sheathed throughout with precious marbles and porphyries, but the pendentives and domes are covered with brilliant mosaic on a gold background, most of which today is unfortunately covered by the pious whitewash of the Turks, who, since 1453, have used the structure as a mosque. Besides this great central nave there are two wide aisles, and before the whole structure extends a porch.

When one thinks of this vast building, erected between 532 and 562 A. D., more than thirteen and a half centuries ago, withstanding earthquakes and the buffetings of war, one can-

not help realizing that the ancients knew more of structural technicalities than we ordinarily give them credit for. Not only was this a superb creation from the point of beauty, one of the most imposing structures on earth, but also it was an engineering feat of the highest merit. The Romans, to be sure, had also learned the secret of balancing huge weights high in air on only a few points of support, and as a matter of fact, it was very likely from them that the Byzantines learned the art. But here it was carried to a degree never dreamed of by the Romans.

This Byzantine use of the dome is still the characteristic architecture of modern Greek and Russian church architecture, and it early invaded the West. The most patent example here is the *Church of St. Mark*, erected at Venice in 1063. Here also we find the rich display of fine marbles in columns and walls, and of mosaics on the domes and upper walls. The exterior has been modified by later builders to have a richer appearance than was generally the case with Byzantine structures, for here again, as with the churches of the early Christian architects, the main effect was planned for

the inside. Hagia Sophia itself presents a somewhat huddled appearance from the outside. Not until Romanesque and Gothic times did architects again devise structures imposing both within and without.

ROMANESQUE IN ITALY AND FRANCE

When Charlemagne died, in 814, there began a gloomy time for Europe, from which it was not to recover until the eleventh century. The division of the empire into three parts led to conflicts of which we have not yet seen the end, as we can see in the Great War. Tribes of barbarians swept down out of the north, and civil strife broke out everywhere. When the great monarch died, the Roman type of basilica was still serving for the type of Christian church. About the year 1000 A. D. we see the birth of a new sort of architecture, called the *Romanesque*, and the way is made clear for that re-awakening of the human spirit which we know as the Gothic period and the Renaissance.

Romanesque is a good term for this form of construction, for whereas it was derived from

the Romans, it also possessed traits sufficiently clearly marked to warrant a distinction. The round Roman arch was still employed, but with a totally different feeling for decoration from that employed in Rome. A barbaric zigzag pattern about the doors and windows was now used, borrowed from northern peoples. The chief difference from the older Christian basilica lay in the fact that the ceiling was now vaulted with stone instead of roofed with wood, and the more primitive conditions now obtaining led to the abandonment of brilliant mosaics and fine marble. The floor-plan of the church had been changed, too, and given that form of a cross which we still see in most churches. This was brought about by adding two *transepts* at right angles to the nave of the church, near the choir or altar-end of the structure, and very likely was the result of the wave of symbolism which swept over the land about 1000 A. D., when the earth did *not* come to an end as had been predicted.

The type of vaulting now introduced was something new in western architecture, which greatly simplified the construction and paved the way for those later achievements of Gothic

architecture which are still our wonder and admiration. For whereas the Romans had needed huge systems of scaffolding and centering for the erection of their barrel-vaulting, only a very scant support was now needed from corner to corner of each section or bay, for the throwing across of the first diagonal ridges, which then formed, as it were, two intersecting and self-supporting arches, on which the rest of the vault could be built in quite easily, with slight support or even none at all. The ceiling or roof was thus broken into small sections, but as the architects increasingly mastered the new art they arranged these panels in interesting patterns, which really added to the beauty of the structure.

The resulting church buildings were somewhat squat and heavy, as we can see, for instance, in the *Cathedral* at Pisa, with its attendant *Baptistery* and *Leaning Belfry*, at least they impress us that way after we have grown accustomed to the loftier Gothic type of building. In this same cathedral we can also see the curiously unarchitectural use of rows of columns piled one on top of another, which Romanesque builders very likely adopted

from Asiatic architects, with whose work most mediaeval craftsmen were in intimate touch, through trade and the crusades. It is unarchitectural, of course, because the columns here serve no structural purpose but are merely stuck onto the building for ornament. The famous leaning tower itself suffers from the same fault, although here the delicate workmanship and lovely color go far to make us forget its shortcomings otherwise. At Piacenza and Verona we find Romanesque churches with those fine porches which make of so many early Italian cities a joy to visit. Supported on slender columns which rest on the backs of crouching lions, these small porticoes have the characteristic round arch of the Romanesque.

In France the churches lack these porches, and while their western fronts are generally more decorated than was the case in Italy, they seem more constricted and narrow-shouldered than the Italian churches. But it was from the great French abbeys, such as those at Cluny and Fontevrault, that the great wave of Romanesque building seems to have swept over Europe. The eleventh and twelfth centuries were given over to this enthusiastic building up of

the visible strength of the church, which, with the royal power, was increasingly usurping the sway over men's activities, both of body and of soul¹.

ROMANESQUE IN ENGLAND AND GERMANY

Especially noteworthy was the development of Romanesque in Germany, where the genius of this style seemed to fit in perfectly with the sturdy nature of the people. The eleventh-century cathedrals of Mainz, Speyer and Worms, took on a unified sense of design and solidity that showed at last an architectural form which could be imposing both within and without. Towers were frequently erected at both the eastern and the western ends of the churches, which somewhat detracted from their unity of impression unless, as also was sometimes the case, a larger central tower was built over the crossing of the nave and transepts, to dominate the whole structure.

Nor must we forget the famous palace of the *Wartburg*, erected about 1150, and renowned in the annals of mythology, poetry and music, for its connection with Tannhaeuser, the Min-

nesingers, and Wagner. Its high rectangular hall in three stories, with arcaded windows, was repeated in other baronial and royal buildings throughout the country.

As to England, we must remember that the Norman Conquest took place in 1066, in this very period of Romanesque architecture, which in consequence is here generally called, both in church and the grim fortress-like homes, *Norman*. *Saxon* architecture had been but a crude and diminutive affair, as we can see in the surviving *Church of St. Laurence* at Bradford-on-Avon and in the Saxon balusters which were built into the triforium at *St. Albans*. The Norman prelates who ousted their native predecessors immediately began the erection of great Norman cathedrals, beginning with *St. Albans* about 1077, and continuing at *Durham*, *Norwich*, etc. Many of these early huge piles were covered with wooden ceilings, which allowed of larger windows than was usually the case in Romanesque churches.

English architects even in this early period were devising ground-plans different from those on the continent, and were paying far less attention to the western portals than was

the case in France and Italy. These features persisted into Gothic times as well, giving to the English cathedrals a character all their own. Whoever has looked upon that rich portion of Canterbury cathedral which dates from Norman times, however, or visited the noble ruin of the Abbey at Malmesbury, can realize the great beauty that was inherent in the Romanesque type of architecture, and will never again look upon it as only an insignificant prelude to the greater Gothic style which followed it. There is one little Romanesque church at Beauvais, which with its restrained and delicately carved decoration and its superb wheel-window has repeatedly won my heart even over the sublimely high-soaring lines of the much later cathedral, and sometimes I have almost been led to regret the so-called advance into Gothic architecture.

GOTHIC ARCHITECTURE IN FRANCE

Just as the Romanesque architecture of the eleventh and twelfth centuries was characterized largely by its use of the round arch, so in the latter part of the twelfth century there emerged a further development of architecture,

characterized by the pointed arch, and destined to play a magnificent rôle in Europe throughout the thirteenth, fourteenth and fifteenth centuries. The origin of this pointed arch is still a matter of some dispute among scholars, who claim for it variously an Asiatic origin, introduced through the closer relationship brought about by the Crusades, or simply a natural evolution from the Romanesque type of vaulting. Be that as it may, we do find that in these years this same type of arch was employed in all of western Europe and in Syria, and what might be called the Near East in general.

It is true that certain other characteristics of Gothic architecture were the natural outgrowth of experiments with the Romanesque. Thus it had been found that the great weight of the stone vaulted ceilings was as a matter of fact concentrated on only a few spots, and that by reinforcing these points with additional supports or buttresses, the rest of the supporting wall might be lightened or even done away with altogether, allowing the insertion of huge windows such as were never attempted in the more primitive style. France took the

lead in this movement, and the cathedral church of *Notre Dame* at Paris, begun in 1163, was the first great monument attempted in the new manner. Here the new effect is immediately perceptible. The outer walls are largely given over to windows, while the support to the vaulted roof is carried not only on buttresses build directly against the walls, but, by means of flying arches, is shifted out to huge piles of masonry standing free from the main part of the building. These are the famous *flying buttresses*, a feature never used in any other scheme of architecture, and one of the most original devices of Gothic construction. These same principles were employed in the superb cathedrals of *Chartres* (1194-1240), *Rouen* (1202-1220), *Rheims* (1212-1242), *Amiens* (1220-1288), etc., with varying detail. The *Sainte Chapelle* (1242-1247), at Paris, built to receive the sacred relics of the Passion brought back by St. Louis, is practically built of windows, with the stone vaulted ceiling carried on slender shafts which seem quite negligible from within. These great windows, fifty feet in height and fifteen feet across, are filled with some of the most glorious stained glass on

earth, dating from the same time, as are the windows at Chartres, and were also perhaps influenced by Oriental practice. The *tracery* in these windows, as the stone mullions and circular designs are called, was at first extremely simple, mere geometrical combinations of the simplest elements. As the architects mastered the new technique, however, this tracery became more ornate, so that at length it seemed a mass of open spaces shaped like the flame of a candle, whence its name of *flamboyant*, a term often applied to the later type of Gothic. This same tendency to complication was also evident in the groining of the stone vaulted ceilings, which gradually grew more and more ornate, offering, along with the window tracery, a convenient method of determining the period of the structure.

The ground-plans of French cathedrals were all more or less the same, with a long *nave* and *choir* surrounded by *aisles*, single or double, and broken by the *transepts*, which formed the arms of the cross. Chapels were frequently erected all along the aisles, so that a French cathedral really becomes a congeries of diminutive places of worship, each with its altar, al-

though the whole is dominated by the high altar at the eastern end of the choir. Amiens, the longest of the French cathedrals, reached a length of 521 feet, while Beauvais, the highest Gothic cathedral, has a vaulted ceiling which towers 160 feet above the pavement. In the earlier churches, as at Notre Dame, circular columns were still employed, but as the architects came to consider their style as a whole, these incongruous elements were eliminated, and *clustered columns* were introduced, which tended to give a clearer impression of upward soaring lines, without the break of the capitals to mar this effect. For Gothic architecture was essentially an architecture of vertical lines, just as Greek architecture had emphasized the horizontal. Look at a picture of a Greek temple and then examine a photograph of a Gothic cathedral, and you will see the utter contrast. This it was, of course, which led Renaissance architects to apply the inappropriate term of *Gothic* to this mediæval style which so offended their classically trained eyes. With them it was a term of reproach, implying barbarity.

The western façade of French cathedrals

also followed one general scheme, although varied infinitely in its details. As we can see in the early case of Notre Dame at Paris, this western front was divided into three horizontal parts, comprising first the *portals*, second, the *rose-window*, and third, the *towers*. Here they are clearly marked, but later, as at *Rouen*, the three sections become interfused, through the application of carved screens of decorative carved stone. The towers also varied extremely, as may be seen in the two specimens on the cathedral at Chartres, the southermost of which is considered the finest Gothic spire in existence, rising in one splendid unbroken sweep from the ground to its pinnacle, whereas the northern spire was a fifteenth century addition broken into a thousand smaller pinnacles and a graceful tracery of stone work. The portals also grew more complicated in their decoration, and at length became deep caverns filled with a complexity of statues and columns. The north and south doors were embellished in the same way in later churches, as once more is shown in the wonderful structures at Chartres.

Nor must we forget the secular employment of Gothic architecture in France, as exempli-

fied in the towering structure of *Mont St. Michel*, so wonderfully dealt with, along with Chartres cathedral, in Henry Adams's great book.

GOTHIC ARCHITECTURE IN ENGLAND

England also had a notable development of Gothic architecture, influenced in many of its details by the more northern type of construction found in Normandy. Thus the central towers or spires typical of so many English cathedrals, such as *Ely*, *Durham*, *York*, *Canterbury*, *Lincoln*, and *Gloucester*, find their French counterparts in the church of *St. Ouen* at Rouen, and in the famous *Tour de Beurre* of the Rouen cathedral. English cathedrals were generally narrower and less lofty, also, than the usual French cathedral, and were most usually finished with a square *apse*, whereas the French cathedrals were here generally rounded. The ground-plans also frequently showed a tendency to two ~~sets~~ of *transepts*, which add to the outward appearance of these structures, although, in compensation, the western fronts are as a whole less well organized.

English Gothic did not develop the same flamboyant type of Gothic as the French, but instead evolved in the fourteenth century a characteristic style, called the *Perpendicular*, in which the window-traceries and all the details tended to an almost extreme accentuation of the vertical lines. This is seen to full advantage in the great west window of *St. George's* in Windsor Castle, in *King's College chapel* at Cambridge, and in the *Chapel of Henry VII* in Westminster Abbey. But the vaulting of English churches developed a phantasy of invention such as was never achieved by the French. Especially in that late development called *fan-vaulting*, such as one sees in the choir of *Oxford Cathedral* and elsewhere, where dozens of *groins* branch out from one single support, to meet and mingle in complicated geometrical designs, one finds a totally new development of the principle. This construction was also used in those typically English buildings, the chapter-houses, such as one delights in at Lincoln, Westminster, Salisbury, and Wells, where the cathedral chapter met to deliberate. These were polygonal halls, usually with one central column from which branched

out the myriad vault-ribs to meet the fan-vaults from the sides and angles of the polygon. At York the central column is supplanted by a Gothic dome of wood, very beautiful, by many considered the finest of all.

Many of the cathedrals of England are surrounded by broad lawns and a complicated group of open cloisters, chapter-houses, church schools, episcopal palaces, etc., most picturesque as a setting and widely different from the French custom of erecting their great cathedrals in the heart of the town, with the burghers' houses and shops frequently leaning against the very walls of the sacred structure. It should be noted also, that more of the English cathedrals were carried to completion than was the case on the Continent. Hardly a French cathedral has the spires and towers which were originally planned for it, whereas most of the English cathedrals were finished as designed. The spire of Salisbury cathedral, 424 feet in height, is a perfect culmination to this great pile, whereas all that we have of Beauvais cathedral, for instance, is a truncated form, less than half completed.

GOTHIC ARCHITECTURE IN GERMANY

The Germans clung long to Romanesque architecture, and quite rightly, since they have evolved from it a noble and imposing type of construction, and it was not until the fourteenth century that Germany frankly adopted the newer style. When it did come, however, it came with a fury that drove the Germans frequently into extremes, as in the attenuated mullions in the church at Muehlhausen, the too slender spire, all lace, at Strasburg, and in the overwrought complexities visible at Nuremberg. They did achieve one notable new development, by raising the ceilings of the aisles to the same height as that of the nave, as in the *Frauenkirche* at Munich and elsewhere, thus creating what is known as the *hall-church*, a really very effective construction. In their spires, also, they frequently substituted open stone work for the more solid construction of French and English examples, as in the twin spires of the *Cologne cathedral*, completed only in the nineteenth century after the original fourteenth century designs. The

ed. This does not mean, of course, that it is the most beautiful of the cathedrals. For its decorations are somewhat mechanical, cut-and-dried, although correct enough, as is the case in our own *Cathedral of St. Patrick* at New York. Another characteristic of many German churches, both Romanesque and Gothic, is the fact that brick was used in their construction, even the high towers being of this material, as in the two great bulbous structures of the *Frauenkirche*, which form the chief characteristic of the Munich sky-line.

The secular structures of Germany, especially Nuremberg, of this period, are many of them quaint and charming. Several towns have been preserved intact from Gothic times, with hardly a modern structure to mar the effect, notably *Winkelsbuehl* and *Rothenberg*. In Belgium the town-halls of Brussels and Louvain, and the guild-halls of Bruges, Ghent, along with the cloth-hall of Ypres, unfortunately now lost to

the demon War, also show the splendid place mediæval cities must have been. The two finest churches in Belgium are *Ste. Gudule* at Brussels, and the seven-aisled *Cathedral of Antwerp* with its lofty and over-decorated but very lovely south spire, like a high-flung bit of Mechlin lace.

GOTHIC ARCHITECTURE IN ITALY

Gothic architecture never became fully acclimated in Italy, despite the two or three notable exceptions which immediately spring to mind to the contrary, such as the *Milan cathedral*, the *Doge's Palace* at Venice, and the *Campanile* at Florence. The climate, in the first place, did not demand or even permit of the huge windows which we have seen were one of the prime characteristics of the Gothic development. The *Sainte Chapelle*, if transferred from Paris to the Florentine sunlight would become an unbearably dazzling jewel casket, insufferably hot. The Italians needed rather, cool shadowy churches with not too large windows. They were filled, moreover, it must be remembered, with centuries of Byzantine

ne training, which veneered its buildings in
right marbles, depending rather on surface
color than on the play of light and shadow as
as the case in French Gothic. Even when
lopting this latter method, as at Milan, the
alians carried the principle too far, giving us
crowded mass of bristling pinnacles which we
ore marvel at than admire.

The monastic orders were great builders of
churches in the thirteenth century, and did
much to spread the Gothic type of structure, as
for instance in the double *Church of St. Fran-*
co at Assissi, *Sta. Maria Novella* at Florence,
etc. But the various cities themselves took
pride in erecting great churches, as was also
the case in other parts of Europe, and to this
spirit we owe the cathedrals of Siena, Flor-
ence, etc. The *Siena Cathedral* has also cer-
tain Romanesque details, and throughout is
built in alternating courses of black and white
marble, hardly a successful experiment, prob-
ably copied from Oriental sources, where the
practice is a favorite one. The *Florence Cathe-*
dral is covered outside with colored marbles,
and within is severely plain and bare, one of
the most disappointing structures imaginable.

The great dome is of Renaissance workmanship, but the superb Campanile, designed Giotto (died 1336) is Gothic in details, and was quite rightly considered by Ruskin one of the "touchstones" of perfect architecture. It is one of the most beautiful monuments of antiquity. In the cathedral here as elsewhere can be seen those iron tie-rods, binding together the arches and vaults, in which the Italians were not sufficiently interested to buttress them properly, so much more engrossed were they in the decoration of surfaces. In most cases the cathedrals and churches were never given their finishing western front. Siena is a fine exception to this, where Giovanni Pisano (about 1235-1320) carved the ornate front in 1284. But the western facade of the Florence cathedral has been added in our own day, while that of Milan contains inappropriate Renaissance elements.

The *Palazzo Vecchio* with its frowning battlements, at Florence, with its neighboring *Loggia dei Lanzi*, Gothic only in its decorative details, can be contrasted with the light grace of much architecture in Venice, of the Gothic period. The lovely little *Ca d'Oro*, as subtl

balanced in its arrangement as a Japanese print, as well as several other palaces along the Grand Canal, and the fine double arcade of the *Doge's Palace*, already mentioned, are among the supreme achievements of Gothic secular architecture.

In Spain, Gothic architecture came into full swing closely following on the conflicts which, beginning in 1217 and ending in 1492, finally drove out the Moors. Filled with pride and thanksgiving, the Spaniards erected great cathedrals after the French manner, at Toledo, Burgos, Salamanca, Barcelona, etc., and in 1401 began the cathedral church of Seville, the largest mediæval church in Europe. In the fifteenth century, decoration here went beyond the bounds of propriety as it did everywhere in Europe, although it sometimes achieved results which in a minor sort of way can charm our senses.

MOORISH ARCHITECTURE

The Moors, who had overcome the Spanish peninsula in 710-713, left behind them some splendid examples of their architecture, a branch of Arabic art, which, together with

that of the Persians, 'Turks and Hindoos, was derived largely from Byzantine sources, mixed with native elements. Highly gifted in their civilization and in architecture, this people left an invaluable heritage to Spain, in a multitude of beautiful buildings, which still are an inspiration. The *Alhambra*, dating from about 1300, is the masterpiece, with its wide courts and sheltering porticoes; and then there is the lofty *Giralda* tower, model for our own *Madison Square Garden*, and Seville and Malaga both boast of *Alcazars*.

The Koran forbids the use of the human figure in art, and thus we find all Mohammedan exercising their ingenuity in devising geometrical patterns with which to cover their walls and windows. Arches are fretted and fringed with carved detail, windows are filled with pierced stone work of the utmost delicacy, fragments of Holy Writ in the original beautiful flowing characters are inscribed on the walls amid a thousand curious scrolls and diaper patterns which we still call *arabesques*. Another decorative feature of this architecture is the *stalactite* formation, composed of an infinite combining of tiny pendentives and corbels, looking like

honeycomb, and generally rich colored, like the rest of the architectural details.

The Moorish mosques, such as the curious specimen at *Cordova*, with horse-shoe arches of alternating colored stones, became the customary style for Jewish synagogues, through their having been built for Spanish Jews at this time by Moorish workmen. The type has persisted to present times in other parts of the world as well.

THE EARLY ITALIAN RENAISSANCE

If Italy never rose to great heights with the Gothic style of architecture, she offered ample compensation in the Renaissance manner of building, and led the world into the new era, which we have not yet left. As early as the thirteenth century there were flushes of the coming dawn, in sculpture and painting, at least, but it was not until the first part of the fifteenth century that the first step was taken toward a re-working of classical elements, which is surprising, since all about them in Italy were vestiges of the Roman works. These were used rather for supplies of ready-shaped

stones than as models of construction, however, for approximately ten centuries.

Florence blazed the way, that wonderful little city of beauty, mother of all the arts in a very real sense of the word. Public pride arose in about 1417 and clamored to have the cathedral roofed in somehow. The great yawning octagon, 143 feet across, made an unsightly gap in the structure, and a competition was held for architects to solve the problem. Brunelleschi (1377-1446) won the commission, and planned the huge dome over the space as we see it today. This was not a direct imitation of any work of classical times, and, indeed, outside of Mohammedan art it was the first dome of its type on earth, topped with a white marble lantern. This fact can stand as typical for us of all the work of this early Renaissance. Architects did not so much imitate directly, as was later the case, but went to ancient works for details and for decorations, which were then worked up into a totally new concoction, something unmistakably of modern times, something essentially Florentine.

Other churches were also built, such as for instance the delicate *Pazzi Chapel* and *St.*

Lorenzo and *San Spirito*, all at Florence. These employed classical columns, but used them in an unclassical manner, each isolated column standing with its tiny section of entablature balanced on its head, supporting the round arches between nave and aisle. The effect was novel, and still is charming. Exquisite mouldings about doors and windows were fashioned from antique motives, altars and pulpits were shaped of classical columns and corbels, in a manner which seems natural enough to us now, but which then was a great innovation. Florentine architects went to all parts of Italy, spreading the new doctrine of old architectural details.

But it was in its palaces that Florence really made its greatest success, and we are still assiduously copying these structures in our apartment houses, hotels, and clubs. The *Riccardi* palace was the first, in 1430, built for Cosimo de'Medici by Michelozzi (1397-1473). Outwardly it was as grim and tightly closed as a fortress, which was necessary in those days, but within there opened an arcaded court supported on Corinthian columns. The bottom story was built of rough stones in what is

called *rustic* work, but the upper two stories, with windows, are built of dressed stone, while at the top there is a heavy projecting *cornice*, fit to finish off this majestic pile. The *Pitti* palace was built by Brunelleschi in 1435, wholly of rustic work, on a gigantic scale on the further side of the river. The *Rucellai* and the *Strozzi* palaces, the latter by Benedetto da Majano and Cronaca about 1489, both were on the same general lines as the Riccardi, with a *cornice*, although the Pitti lacked this element. These palaces also were abundantly copied in different parts of Italy. At Venice, in 1481, was built the *Vendramini* Palace, on the Grand Canal, and here at last the fortress character was dropped, as being no longer needed. Rows of open windows between engaged columns lead down to the very water's edge, resting on a stone platform.

Thus we may say that the fifteenth century belonged to Florence in Renaissance architecture, one of the loveliest flowering periods of the human spirit.

THE HIGH RENAISSANCE IN ITALY

But for the fully devolved Renaissance in the next century we must turn to Rome, where once more the popes had established themselves and were building up their dominion, temporal as well as spiritual. Michelangelo (1475-1564), Raphael (1483-1520), and Bramante (1444-1514), all came to Rome at the behest of the Pope in the early years of the sixteenth century, and were later engaged in the construction of *St. Peter's*, the largest church in the world. By this time the study of the masterpieces of Roman architecture had begun to bear fruit, and all of these architects and artists could employ classical details with a sense of conscious correctness unknown to the earlier Florentines. So it is that we sometimes find a coldness and self-conscious propriety about these later works, less pleasing than the more informal even if blundering use of the details in Florence.

The *Giraud* palace and the palace of the *Cancellaria*, both in Rome, show this sense of fitness, does also that portion of the *Vatican* erected by Bramante for Julius II. The *Villa* of this pope, erected by Vignola in 1550, the

Villa Medici, now the seat of the French Academy at Rome, and the *Villa d'Este* with its wonderful gardens at Tivoli, show the same influences under different aspects.

But of course the crowning achievement was *St. Peter's*, begun by Bramante in 1506, strengthened and domed by Michaelangelo in 1546, given its present weak facade in 1606, and completed with its two imposing wide-sweeping arcades by Bernini in the seventeenth century. The church is nearly 600 feet long inside, with the dome spanning a space 140 feet across and rising to a total height of 405 feet. The gilded and marble-incrusted interior is not as imposing as it should be, owing to the gigantic scale of the columns and all the decorations. Michelangelo especially had a leaning toward the overwhelmingly big in architecture, but *St. Peter's* is an excellent exemplification of the truth that majesty in architecture depends more on the proportions than on mere size. The dome is a masterpiece, modeled somewhat after the work of Brunelleschi at Florence, but handled in a totally different manner as to the decorations. The method employed in this church, of having a single gi-

gantic order of columns rise through two or more stories of lesser columns, inaugurated about the middle of the century a new style in church building in Italy, which led almost inevitably to the decline of architecture in the seventeenth century, as we shall see later.

At Venice there was working another innovator, less coldly formal than those architects already mentioned, or than Palladio (1518-1580) whose cold, bare, correct churches also created a style, which bore his name abroad. Sansovino (1477-1570) erected that charming *Library of St. Mark* whose corner was knocked off when the old Campanile fell in 1902. Here an element of richness was gained by adding to an arcade of columns and arches still larger columns outside, which were engaged on the piers between the arches and carried the richly carved entablature above. Two stories were erected, with a stone balustrade on top, on which were ranged stone statues. The resulting effect was rich and yet restrained, and later architects carried at least the main outlines of the scheme completely around the huge open *Piazza of St. Mark's*. This type of structure has been copied innumerable times in modern buildings.

THE FRENCH RENAISSANCE

Francis I of France was responsible for the introduction of Renaissance architecture into his native land. He returned from his victorious Italian campaigns a hopeless captive to all things Italian, which sent him and his nobles into a feverish building of those glorious *chateaux* in the Loire country, such as *Blois*, with its famous open *stair-case* in the court-yard, *Chambord*, etc., and to the erection of the brick and stone *Chateau de St. Germain*, the palace at *Fontainebleau* and the beginnings of the *Louvre Palace* at Paris. In all of these, however, the Italian elements were so thoroughly interwoven with the native French characteristics, that the Renaissance here took on a new feeling, which warrants the name of French. High and steep roofs from mediaeval times were frequently retained, and ground-plans of distinctly Gothic nature were often carried out with Renaissance buildings. In the churches themselves, such as *St. Etienne du Mont* and *St. Eustache* at Paris, Gothic and classic elements were interfused in a manner

hardly legitimate but frequently picturesque. Unfortunately a classical veneer of arches and columns was sometimes attempted for older Gothic churches, as in *St. Michel* at Dijon, where the very towers were sheathed in a stack of pillars.

Florentine influence was continued in the sixteenth century by the two queens Catherine and Marie de Medici, for whom were built the palaces of the *Tuilleries*, destroyed under the Commune, and the *Luxembourg*, both at Paris. In these a firmer and more rigorously correct style was employed, lacking the fine exuberance of the earlier period.

Then came the time of Louis XIV, in the seventeenth century, when architecture became grandiose, symmetrical and rather oppressive, as we see in the vast expanse of the palace at *Versailles*, partially the work of that Mansard (1647-1708) who has given his name to a certain type of roof, and in the long eastern *colonnade* of the Louvre, perfectly proportioned, and very beautiful, even though it leaves one with rather a cold impression. Finer was the imposing dome of the *Invalides*, at Paris, also by

Mansard, with its high drum supported by columns, and its pointed lantern. This gilded silhouette is one of the most pleasing elements of the Paris sky-line, better than the later and more strictly classical dome of the *Pantheon*, erected in the eighteenth century. To the same architect we owe the frigid dignity of the *Place Vendôme* and the graceful little dome of the *Val-de-Grace* at Paris, the first of which seems to look forward to the cold severity of the architecture of Louis XV.

Interiors at this time were rich with gold and paintings, and Gobelin tapestries were frequently used for decorations, as in the sumptuous *Galérie d'Apollon* in the Louvre. At Versailles the famous long *Gallery of Mirrors* looks out over complicated gardens which echo the same opulent spirit, and even the trees are given an architectural treatment by being carved into geometrical shapes or trimmed into long formal alleys. Whereas the rooms of Francis had been somewhat sombre, with straight lines predominating in the decorations and in the furniture, glowing chairs and tables and mouldings covered with gold-leaf were now the rule, gracefully curved and scrolled.

THE GERMAN RENAISSANCE

In Germany the Renaissance underwent a still further modification to local elements. The mediæval architecture, with its picturesque high-pitched roofs and numerous gables, took on a tinge of classical grace, with columns and pilasters and pediments, but the resultant picturesque effect remained essentially German. The middle of the sixteenth century saw this transformation in Germany proper, although in Austria and Bohemia it had arrived still earlier. The masterpiece of this German Renaissance was undoubtedly the castle at *Heidelberg*, where under Otto Heinrich in 1556-1559 and under the County Palatine Friedrich in 1601-1607 were erected two wings, thoroughly Gothic in feeling, and thoroughly Italian in decorative details. Here, as at Berlin and Munich, the general plan was evolved piecemeal, so that today these castles or palaces are collections of odd courts and various structures, at angles one with another, most picturesque in their groupings. At times, as at Landshut, however, palaces of Italian symmetry were erected.

Town-halls were also built under the new inspiration, as at Bremen (1612) with a fine arcade on Doric columns, at Nuremberg, almost severely Roman, and at Augsburg (1615). Private houses abound, among the most charming native Renaissance creations, as was the case also in Holland and Belgium. Here, too, native elements were prevalent, such as the characteristic stepped gables and high dormer windows, Leyden, the Hague and Amsterdam all possess charming town halls, built chiefly of brick, owing to the scarcity of stone in this low country.

Much more florid was the development of the Renaissance in Spain. Recently enriched by the departure of the Moors in 1492 and by the discovery of America, the Spaniards turned from flamboyant Gothic to a sumptuous form of classic art, brought in by Flemish workmen. Much of the detail was borrowed from the silver work which had become so prevalent since the acquisition of the new mines in the Western hemisphere, and to the new architecture was therefore applied the term *Plateresque*, from a word meaning "silversmith." The first half of the sixteenth century was

given over to this style, such as we see in the sumptuous portal of the *University at Salamanca*, filled with flat scrolls and shields and medallions, or in that unique *Casa de las Conchas* in the same city, where the whole facade of the building is patterned with cockle-shells carved at intervals.

The latter half of the sixteenth century in Spain was given over to the more classic style, called locally the *Griego-Romano*. The masterpiece of this period was the huge palace of the *Escorial*, begun in 1563, 740 by 580 feet in size, and dominated by the majestic, domed church with its Doric columns. The graceful upper part of the *Giralda* tower at Seville also dates from this period, as does the over-ornate *Palace of Charles V* at Granada.

THE ENGLISH RENAISSANCE

In England the Gothic style of architecture lingered on well into the sixteenth century, particularly in a form employing a much flattened form of pointed arch called the *Tudor style*. Under Queen Elizabeth foreign artists came to England and influenced the architecture, as

they also held sway over painting, sculpture, gardening, etc. Shakespeare's plays give abundant evidence of the predominant position of all things Italian at this period. Country houses and mansions appeared in this foreign fashion until there finally arose a native architect, Inigo Jones (1572-1652), deeply enamored of the truly classical work of Palladio in Italy, whose very designs he seemed in some cases to have attempted on English soil. It will be remembered that he it was who devised the setting for Milton's classic masque of "Comus."

The *Banqueting Hall at Whitehall* in London is his masterpiece, with its windows bearing pediments of alternating rounded and triangular shape, in the best manner of Palladio. It was to have formed a part of a huge palace, never completed, which would have ranked as the grandest palace of the period.

But greater still was that famous astronomer and architect, Sir Christopher Wren (1632-1723) into whose hands was fortunately put the undertaking of rebuilding most of London after the great fire in 1666. Fifty churches were built by him, with an almost infinite variety

of form and decoration, and there were moreover the lovely cupola to *Tom Tower* and the *Sheldonian Theatre* at Oxford, the majestic pavilions and colonnade of the *Greenwich Hospital*, etc. But his masterpiece of course, was the cathedral of St. Paul's in London, erected on the site of the older Gothic cathedral which had been practically destroyed by the fire. Built on the conventional cross design, with classical details throughout, it is surmounted by a dome towering 360 feet above the pavement, which is still the most imposing spectacle in the city. The west front consists of a two-storied portico with Corinthian columns, topped with a triangular pediment, while at either side is a bell-tower, built up of classical elements. Inside, the vista is somewhat like that in St. Peter's at Rome, but the proportions are such as really to make the smaller church the more imposing. It is less richly decorated than the Roman church, and seems a trifle cold, but when the system of decoration has been completed, this defect will be remedied.

Wren's steeples were perhaps his most influential creation, as far as his effect on later

architects has gone. These were most various in their details, but generally consisted of a pyramidal form, compounded of different classical elements. Perhaps the most successful, for instance, is that of *St. Mary le Bow*, in Cheapside, where on a square tower with classic pilasters, rises a circular colonnade whose central core mounts still higher, masked by classic scrolls, to a small cluster of Corinthian columns, topped with a steep pyramidal obelisk. Such steeples were much copied in early American architecture, particularly in New England, which owes some of its finest churches to Wren's influence.

THE BAROQUE STYLE

This same seventeenth century was for Italy not so happy a period architecturally, since it saw the birth and ugly development of a decadent classicism known as *baroque*, which eventually spread all over Europe. In this style, columns must writhe, as in the huge bronze *baldaquin* devised for St. Peter's by Bernini, and arches must be broken into three or four segments on different planes. Scrolls

are coiled in every corner, and even bear the weight of domes, as in the otherwise lovely church of *Sta. Maria della Salute* at Venice. Ornament is applied for its own sake and no longer has any structural significance, straight lines seem tabu, the picturesque wins over the dignified conception of architecture, the whole style becomes nervous and restless. At the same time the interiors become overcrowded with ornament, in a style which has been termed *Jesuit*, in which the effect gained is cherished above sincerity, the very antithesis of the Greek ideal.

Italy was not alone in this her sinfulness. Germany followed suit, as in the prominent *Theatinerkirche* at Munich, and the *Zwinger* palace at Dresden, which seem almost trivial despite their size. Spain suffered terribly, as in the facade of the cathedral of *Murcia*, to mention only one horrible example, which looks like a bit of pastry elaborately frosted, so vulgar is its general conception and the sense of petty detail. Even England was not spared, as we may see by the entrance to *St. Mary's College* at Oxford, with its twisted columns and mutilated pediment ending in futile scrolls.

France escaped the clutches of this decadence, through the restraining hand of Louis XIV, who, whatever his faults of taste may have been, would never have tolerated excesses of this vulgar type. The furniture of his period, to be sure, and the decorative paneling of his palaces underwent somewhat of a parallel transformation, less irritating here, however, than in the more permanent and serious forms of outward architecture. To this style, together with that of Louis XV, is sometimes given the name of *rococco*, a form which swept the boudoirs of all Europe. Gilding and bright colors were much employed in this somewhat saccharine type of decoration, with which the newly imported Chinese pottery was much used. Larger structures were but rarely attempted in this style, although the gem-like little *Residenz-theater* at Munich, where some of Mozart's operas were performed for the first time, was constructed throughout in this manner.

CLASSIC REVIVALS IN EUROPE

The middle of the eighteenth century saw a remarkable awakening of interest in things classical, which continued until the first quar-

ter of the nineteenth century. Herculaneum and Pompeii were now first unearthed, Winklemann and Goethe in their writings tried to lead men toward a classic balance, and in France the growing forces of the Rationalists looked back to the periods of Greece and Rome as models in all things. It must be remembered that a large part of the French Revolutionists looked upon their activity at first as a return to the first principles of primitive man of Arcadia.

This same interest in things ancient and archaeological manifested itself in the architectural works now erected. In England the *Bank of England* and the *British Museum* were both given facades in which classic details were not merely employed, but ancient models were closely copied direct. At Liverpool the noble form of *St. George's Hall* was erected. Germany saw rise the *Brandenburg Gate* and the *Old Museum* at Berlin, both with classic columns beautifully employed. At Munich were erected several groups of antique buildings, including the Greek *Propylaea* or gate-way, the *Glyptothek* or Sculpture Gallery, the *Pinako-*

theat or Picture Gallery, and an Ionic Exhibition Hall. Outside the city rose the *Ruhmeshalle*, a severely Greek Hall of Fame backing a colossal classic statue of Bavaria.

In France this style is frequently called *Empire*, since it reached its greatest spread under Napoleon. The *Panthéon*, cold and correct, although possessed of a beautiful dome which stands on a high circular range of columns, has a portico with six immense Corinthian columns supporting a classic pediment, on a larger scale than marked the *Invalides* facade or the front of *St. Paul's*, of an earlier classicism. Napoleon built two triumphal arches in Paris, the small *Arch of the Carrousel* in the court of the Louvre, and the huge *Arc de l'Etoile* at the top of the Avenue des Champs-Élysées. Both of these were inspired by classic models. So also was the church of the *Madeleine*, which Napoleon built near the classic Place de la Concorde. It is a perfect replica of a Roman temple outside, and is balanced at the other end of the long vista across the square and the river, by the classic *Legislative Building* with its twelve columns.

Early American architecture also was shaped largely by this same classic revival, which has, as it were, hardened into the official architectural style of our governmental buildings, such as post-offices, etc., to this very day. In the eighteenth century, we developed that charming *Colonial style*, which was essentially a classic movement, worked out in wood. The churches reflected the influence of Wren, the finest structures of the period. In the South arose many stately homes of brick, frequently with high classic columns, while in the North, frame houses, often most chaste and picturesque in their details of columns, porches, doors, etc., were the rule. In California and Florida the predominant style was of course, Spanish, but otherwise the classic revival held full sway. Our earliest public-buildings after the War of the Rebellion were in the same general style, with colonnades, domes, etc., but now executed in more permanent stone. The *New York City Hall* (1803-1812) is a handsome example of this period, as is also the *Capitol* at Washington, begun in 1793 and not completed with its dome until 1873. The *State House* at Boston (1795) and the *University of*

Virginia (1817) are further specimens. Later came a more rigidly correct period of classic imitation, evident in such structures as the *Treasury* and the *Patent Office* at Washington, the *Philadelphia Mint*, the *Sub-Treasury* and the *Old Custom House* at New York. Residences of this period also sometimes bore simulated Grecian colonnades and porticoes, as in the graceful *White House*.

MODERN FRENCH ARCHITECTURE

Owing to the French type of national mind, which yields readily to the voice of authority such as is voiced architecturally by the *Ecole des Beaux-Arts*, or national art-academy, modern French architecture has followed largely in the path of the Renaissance. Under Napoleon III the Louvre received extensive and on the whole most worthy additions, comprising that whole court-yard where now stands the Bartlett statue of Lafayette. This was done in a rich and distinguished form of French Renaissance (1852-1857). The majestic *Grand Opera* (1863-1875) by Garnier, seems to derive more from Venetian architecture of the sixteenth

and seventeenth century, and is perhaps the most sumptuous pleasure-house in the world. Its exterior is one of the finest creations of modern times. The refined little *Musée Galliera* at Paris should also be mentioned as a notable example of modern French Renaissance.

Outside this tradition, however, stood Viollet-le-Duc (1814-1879), a notable archeologist and architect, responsible for the re-awakening in Europe of the interest in Gothic architecture, and for the restorations of Notre Dame and other Gothic structures in France, especially the great mediæval castle of *Pierrefonds*. He even went so far as to predict that perhaps from the new constructive methods in steel, allowing vast open spaces and the accentuation of upright lines, a new Gothic revival might eventually come to pass, a prophecy which we have seen partially accomplished and certainly gloriously vindicated in the spire of the *Woolworth building* at New York. His influence in Paris led directly to the building of the fine *Library of Ste. Genevieve*, and perhaps indirectly to the inception of the many-domed church of *Sacré-Coeur* on top of Montmartre at Paris, Franco-Byzantine in style. The new

Hotel de Ville at Paris is Gothic, echoing the outline of the older structure, destroyed during the Commune.

In the Paris Exposition of 1900 was used an abortive new attempt to get away from classic architecture, and, as a matter of fact, from everything else that had gone before. The free-flowing forms of Nature as exemplified in grasses and leaves seemed to be the chief inspiration of this Art-Nouveau, as it was called, and suddenly the whole western world was filled with furniture and jewelry and vases that writhed and lolled and turned and twisted in every possible combination of long curves anything to escape from straight lines. Fortunately this vogue did not seriously touch architecture, although it did succeed in fastening upon succeeding generations of the beauty-loving Parisians a lot of hideously ugly subway-entrances, of which they have since grown sick and tired.

In England the most noteworthy movement of the nineteenth century after the classic revival, was the spread of what has been called *Victorian Gothic*. The huge expanse of the

Parliament Houses at London shows this movement at its finest, perhaps, (begun 1839) less successful in the *Assize Courts* at Manchester, the *New Museum* at Oxford, the gawdy *Albert Memorial* and the *New Law Courts* both at London. Romanesque also came in for its own, as in the *Natural History Museum* at South Kensington, and the impressive new Roman Catholic *Cathedral* at London.

Italy need be mentioned here only for that huge white *Monument to Victor Emmanuel* at Rome, more notable for its size than for its refinement of proportions or of detail. In Belgium, Brussels can boast of a *Palais de Justice* whose imposing mass crowns the central skyline of the city.

MODERN ARCHITECTURE IN GERMANY

Along with Renaissance and classic elements in German architecture there also appeared a revival of Gothic and Romanesque structures during the nineteenth century. At Munich, for instance, not only was the *Ludwigskirche* built in Romanesque style, but the whole street, a mile in length and including the Library and

the University, who treated in the same architectural manner, producing a dignified vista. In the same city was likewise erected an early Christian *Basilica*. For the most part, however, classic elements prevailed, both in Germany and in Austria, until the end of the century. Among the finest structures of this period are several theatres, as at Dresden, Berlin, and Vienna, and schools and universities, as in the *Bauschule* at Berlin, and others at Karlsruhe, Stuttgart, Vienna, etc. The huge *Reichstag* building at Berlin, with its square glass and iron dome, cannot be called a success. The ornate *Imperial Museum* at Vienna can be taken as typical of the gaiety sought in much of the later architecture of that city.

But the twentieth century has seen the spread of a new type of architecture, owing its origin latterly to an Austrian, Otto Wagner, although reaching still further back, perhaps, to two Belgian architects, Hankar and Horta, who gained their ideas, it seems, from the English aestheticians Ruskin, William Morris, etc., who undoubtedly were thrilled by the plea for architectural sincerity voiced by Viollet-le-Duc back in 1860. This movement, now called *Secession*

would have modern architects devise a modern style of building of our own, and not forever harking back to antique models with which our modern life has no longer any direct relationship. The movement gained great impetus before the war of 1914, and according to all reports has continued its progress in Germany and Austria since that time. Quite appropriately its chief works have been for the housing of industrial plants, department stores, railroad stations, etc., since ours is essentially an industrial civilization, but it has also done some notable work in both lighter and more monumental forms. The permanent *Exposition grounds* at Munich, including the epoch-making little *Kuenstler-theater*, were built throughout in the somewhat stolid new style, as were the great *Voelkerschlacht* monument at Leipzig and the *Bismarck monument* at Bremen.

The chief characteristics of this interesting new development, which has hardly touched America, are a frank acceptance of modern structural conditions, and an attempt to handle these sincerely, without the intervention of classical conceptions. Masses and decorative details thus treated seem to uninitiated eyes

primitive and wayward. Archaism has been charged against the new style, which nevertheless has done in both Germany and Austria some of the most effective as well as the most original work of the twentieth century.

MODERN AMERICA

The distinguishing element in American architecture in recent times has been, perhaps, its ability to pick and choose the things wished to imitate or emulate, in other words its *eclectic nature*. We have assimilated everything from Greek times to our own, including Roman, Byzantine, Romanesque, Gothic and Renaissance, and somewhere or other have used these styles to good advantage. The Paris Ecole des Beaux-Arts has undoubtedly been largely instrumental in shaping the destiny of our cities latterly, since many of our finest architects have gained their European schooling in that academic atmosphere.

Following on the Gothic revival there came a great sweep of the Romanesque, under the powerful influence of H. H. Richardson, who designed the *Trinity Church* at Boston, and *Courthouse* at

Jail at Pittsburgh we can still admire. But in lesser hands this difficult style proved more intractable, and was finally abandoned. The *Cathedral of St. John the Divine* at New York was begun in a Romanesque style, but has since then been carried on in Gothic, under the supervision of Ralph Adams Cram (born 1863), also responsible for the massive Gothic rebuilding of *West Point*, the new buildings at Princeton, and the beautifully balanced church of *St. Mark's* at New York, perhaps the finest specimen of Gothic in the city.

The *Columbian Exposition* at Chicago in 1893 was a revelation of classical architecture which had a great effect in elevating the taste of the American people. Another excellent influence was the enlightened eclecticism of Stanford Whit, to whom we owe the delicate grace of *Madison Square Garden*, the Italian charm of the Washington Square memorial church, and the great *Pennsylvania Station*, all at New York. This last is the most imposing imitation of Roman architecture in the country. In the church erected by this same architect for Dr. Parkhurst, in Madison Square, America owned a superb example of the domed Byzan-

tine style, now unfortunately destroyed. The *Boston Public Library* is a finely restrained creation, better in its total effect than is the more ornate *Congressional Library* at Washington. It would manifestly be impossible to point out all the notable buildings of modern America, where the chief note today is the complexity of our civilization and the free choice allowed to architects to roam almost at will in all the styles of the past, in their attempts to portray modern culture in their buildings. Domestic architecture especially has been a promising field of endeavor, and in America has latterly been achieving some beautiful results, ranging from our own Colonial to English styles and to those of France, Italy, and in the West, to those of Spain.

But the most original développement in American architecture has, of course, been in the evolution of the *skyscraper*. The problem here was to erect a fireproof structure to great heights with comparatively light walls, since steel construction no longer demanded the tremendous mass to support the upper stories. Structural steel, elevators and the soaring land values of our large cities brought about the

new type of building, which at first was hailed with a storm of protest. At first, be it confessed, the new structures were not beautiful, since the architects were frankly at sea in the handling of a problem such as had never been before propounded. The solution seems to have been found in treating these high buildings essentially as towers, however, so that our large cities will eventually become largely a congeries of separate beautiful buildings of this type. The *Singer* building, with its French Renaissance treatment in red brick and yellow stone, the *Metropolitan Life* tower, patently modeled on the Venice campanile, and the beautiful upper section of the Gothic *Woolworth* building have been the most successful solutions thus far offered. The huge *Equitable Life* building seems to have succumbed to its impossible task of giving architectural meaning to its enormous blank walls pierced by thousands of small windows, and to have concentrated its architectural attention on the decoration of its lower stories. American cities are at present so homogeneous in their civilization and their architecture, that these few examples can suffice to show what is going on all over the country.

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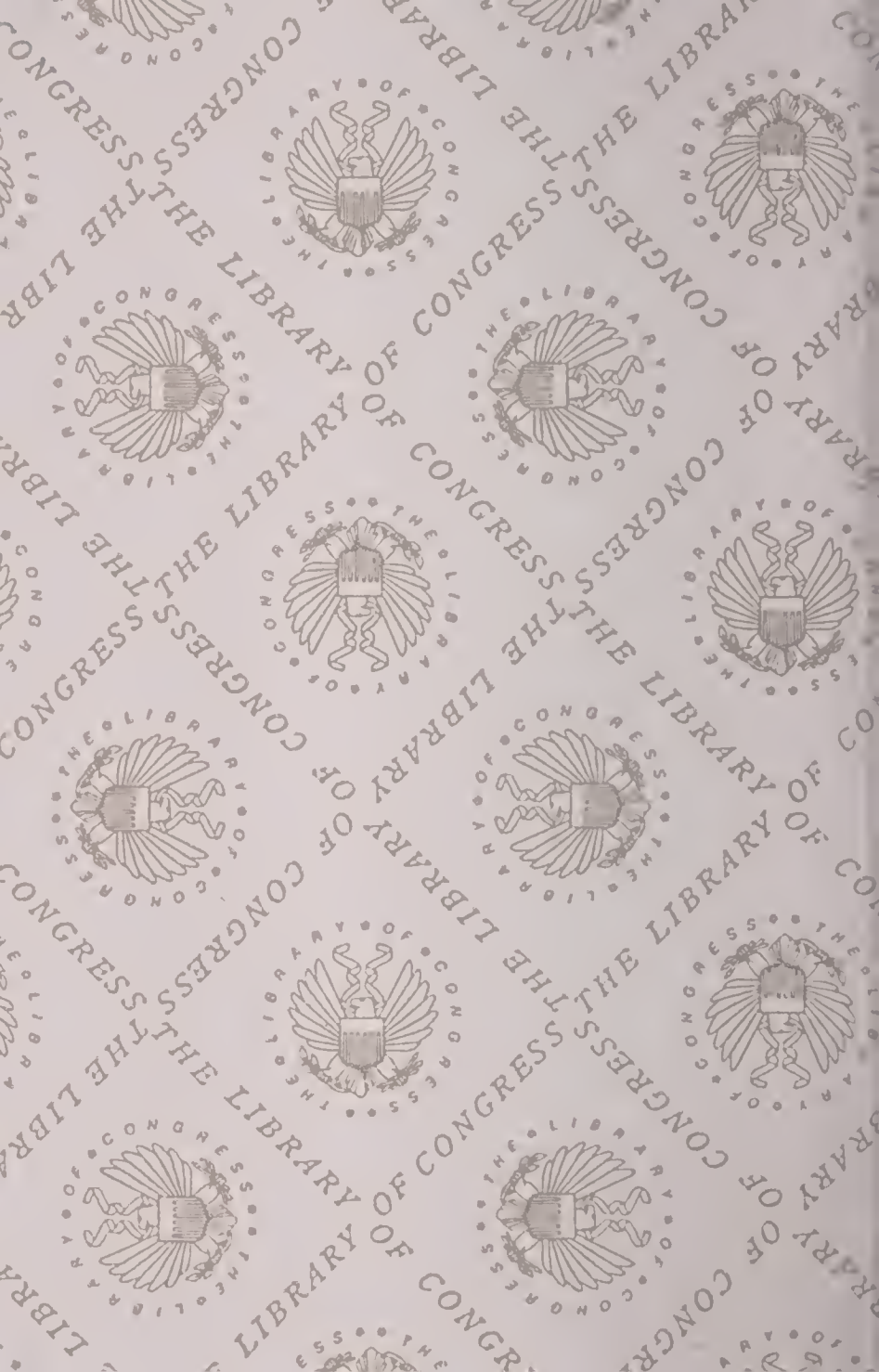
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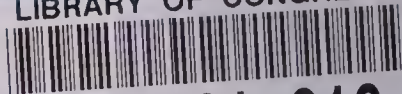


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